

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A process for applying a water-based catalyst ink onto a substrate, said process comprising the steps:

(a) coating a substrate with the water-based catalyst ink under conditions of controlled humidity and temperature to form a deposited catalyst ink on said substrate, wherein said catalyst ink comprises an electrocatalyst, an ionomer solution and water;

(b) leveling the deposited catalyst ink under conditions of controlled humidity and temperature to form a catalyst-coated substrate; and

(c) drying the catalyst-coated substrate at an elevated temperature

wherein the coating step (a) occurs in a coating compartment and the leveling step (b) occurs in a leveling compartment for a period of 1 to 10 minutes, and

wherein the humidity in the coating compartment is maintained at 60 to 100 % relative humidity and a temperature in the range of 10 to 60°C, and the humidity in the leveling compartment is maintained at 60 to 100% relative humidity and at a temperature in the range of 10 to 60°C

wherein said catalyst ink comprises 5 to 75 wt.% of an electrocatalyst, 10 to 75 wt.% of an ionomer solution and 10 to 75 wt.% of deionized water and further

~~comprises a surfactant with a vapor pressure between 1 and 600 Pascal, present in an amount in the range of 0.1 wt.% to 20 wt.%, based on the weight of the catalyst ink.~~

2. (original) The process according to claim 1, wherein said catalyst ink further comprises an organic solvent.
3. cancelled.
4. (previously presented) The process according to claim 1, wherein the substrate is selected from the group consisting of a hydrophobic polymer film, a transfer tape material, a paper-based material, a decal substrate, a metal substrate tape, an ionomer membrane, a carbon paper, a carbon fiber substrate, a carbon cloth, a woven or nonwoven carbon mesh, a needled felt, a knitted fabric, and a carbon felt.
5. (original) The process according to claim 4, wherein said substrate is present in individual sheet or in continuous roll form.
6. cancelled.
7. cancelled.
8. (previously presented) The process according to claim 1, wherein the drying step (c) is performed at a temperature in the range of 40 to 150°C for 1 to 10 minutes.
9. cancelled.
10. cancelled.

11. (withdrawn-previously presented) A catalyst-coated membrane comprising the catalyst-coated substrate produced according to the process of claim 1.
12. (withdrawn-previously presented) A catalyst-coated gas diffusion substrate comprising the catalyst-coated substrate produced according to the process of claim 1.
13. (withdrawn-previously presented) A catalyst-coated polymer film comprising the catalyst-coated substrate produced according to the process of claim 1.
14. (withdrawn-previously presented) A membrane-electrode-assembly comprising the catalyst-coated membrane of claim 11.
15. (withdrawn-previously presented) A membrane-electrode-assembly comprising the catalyst-coated gas diffusion substrate of claim 12.
16. (withdrawn-previously presented) A membrane-electrode-assembly comprising the catalyst-coated polymer film of claim 13.
17. (withdrawn) A method of using the membrane-electrode-assembly of claim 14, comprising operating a PEMFC or DMFC fuel stack, wherein said fuel stack is comprised of said membrane-electrode assembly.
18. (withdrawn) A method of using the membrane-electrode-assembly of claim 15, comprising operating a PEMFC or DMFC fuel stack, wherein said fuel stack is comprised of said membrane-electrode assembly
19. (withdrawn) A method of using the membrane-electrode-assembly of claim 16, comprising operating a PEMFC or DMFC fuel stack, wherein said fuel stack is comprised of said membrane-electrode assembly.

20. (previously presented) The process according to claim 1, wherein the coating of the substrate is applied by screen printing, stencil printing, offset printing, transfer printing, doctor blading, brushing, or spraying.

21. (previously presented) The process according to claim 1, wherein the coating step (a) and the leveling step (b) are performed in one compartment comprising a coating section and a leveling section.

22. (previously presented) The process according to claim 1, wherein the ionomer solution is water-based and contains 5 to 20 wt.% of ionomer.

23. (previously presented) The process according to claim 1, wherein the ionomer solution is organic solvent-based and contains 5 to 20 wt.% of ionomer.

24. (new) The process according to claim 1, wherein said catalyst ink further comprises a surfactant with a vapor pressure between 1 and 600 Pascal.